UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P O Box 1450
Alexandria, Virginia 22313-1450
www uspto gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/791,854	03/04/2004	Su-Jin Han	P57016	5248

8439 7590 03/09/2009
ROBERT E. BUSHNELL & LAW FIRM
2029 K STREET NW
SUITE 600
WASHINGTON, DC 20006-1004

EXAMINER	
TURNER, KATHERINE ANN	

ART UNIT	PAPER NUMBER
1795	

MAIL DATE	DELIVERY MODE
03/09/2009	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/791,854	HAN ET AL.	
	Examiner	**Art Unit**	
	Katherine Turner	1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *12 February 2009*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,4-15,19-27 and 31-37* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1, 4-15, 19-27 and 31-37* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

1. The amendment filed February 12, 2009 has been entered. Claims 1, 4-15, 19-27 and 31-37 are pending. Claims 5 and 27 are amended. Claims 9-11, 24-25 and 36-37 are no longer withdrawn.

2. The text of those sections of Title 35, U.S.C. code not included in this action can be found in the prior Office Action issued on July 8, 2008

Election/Restrictions

3. Examiner acknowledges that the petition to withdraw the restriction requirement is granted, thus the restriction requirement is withdrawn. Accordingly claims 9-11, 24-25 and 36-37 are no longer withdrawn from consideration.

Claim Rejections - 35 USC § 103

4. The claim rejections under 35 U.S.C. 103(a) as being unpatentable over Osamu et al. (JP 2000-208130) in view of Kono et al. (JP 2001-273884) on claims 1 and 8 are withdrawn, because Applicant's arguments as to independent claim 1 are persuasive.

5. The claim rejections under 35 U.S.C. 103(a) as being unpatentable over Osamu et al. (JP 2000-208130) in view of Kono et al. (JP 2001-273884) and Uba (US 4,421,832) on claims 4-6 are withdrawn, because Applicant's arguments as to independent claim 1 are persuasive.

6. The claim rejections under 35 U.S.C. 103(a) as being unpatentable over Osamu et al. (JP 2000-208130) in view of Kono et al. (JP 2001-273884), Uba (US 4,421,832) and Planchat (US 4,735,630) on claim 7 is withdrawn, because Applicant's arguments as to independent claim 1 are persuasive.

7. The claim rejections under 35 U.S.C. 103(a) as being unpatentable over Osamu et al. (JP 2000-208130) in view of Kono et al. (JP 2001-273884), Uba (US 4,421,832), Planchat (US 4,735,630) and Masumoto et al. (WO/2003/003485 on claims 12-13 are withdrawn, because Applicant's arguments as to independent claim 1 are persuasive.

8. The claim rejections under 35 U.S.C. 103(a) as being unpatentable over Osamu et al. (JP 2000-208130) in view of Kono et al. (JP 2001-273884), Planchat (US 4,735,630) and Masumoto et al. (WO/2003/003485) on claims 14, 23, 26-27 and 35 are withdrawn, because Applicant's arguments as to independent claims 14 and 27 are persuasive.

9. The claim rejections under 35 U.S.C. 103(a) as being unpatentable over Osamu et al. (JP 2000-208130) in view of Kono et al. (JP 2001-273884), Masumoto et al. (WO/2003/003485) and Yamahira et al. (US 2002/0012829) on claim 15 is withdrawn, because Applicant's arguments as to independent claim 14 are persuasive.

10. The claim rejections under 35 U.S.C. 103(a) as being unpatentable over Osamu et al. (JP 2000-208130) in view of Kono et al. (JP 2001-273884), Masumoto et al. (WO/2003/003485), Yamahira et al. (US 2002/0012829) and Uba (US 4,421,832) on claims 19-21 and 31-33 are withdrawn, because Applicant's arguments as to independent claims 14 and 27 are persuasive.

11. The claim rejections under 35 U.S.C. 103(a) as being unpatentable over Osamu et al. (JP 2000-208130) in view of Kono et al. (JP 2001-273884), Masumoto et al. (WO/2003/003485), Yamahira et al. (US 2002/0012829), Uba (US 4,421,832) and Planchat (US 4,735,630) on claims 22 and 34 are withdrawn, because Applicant's arguments as to independent claims 14 and 27 are persuasive.

12. Claims 1, 8-9 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Osamu et al. (JP 2000-208130, refer to IPDL JPO machine translation for citation) in view of Yoshimura et al. (JP 06-096793, refer to IPDL JPO machine translation for citation).

As to claims 1 and 8, Osamu et al. discloses a secondary battery (paragraph 13) comprising:

- an electrode body (2) (Applicant's unit) having a positive electrode sheet and a negative electrode sheet (Applicant's first and second electrode plates), a separator interposed therebetween, and two electric conduction tabs (4 and 5) (Applicant's first and second electrode tabs) respectively drawn upward

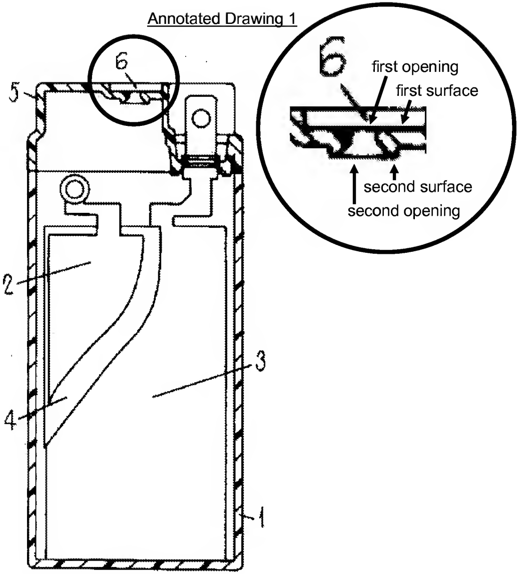
(Applicant's extending from) the positive electrode sheet and the negative electrode sheet (Applicant's first and second electrode plates) (drawing 2; paragraph 13);

- a cell case (1) (Applicant's can) adapted to accommodate the electrode unit and electrolysis solution (Applicant's electrolytic solution); and
- a lid (6) (Applicant's cap plate) adapted to seal the can (paragraph 2, lines 1-2) and having an injection hole (14) for electrolysis solutions (Applicant's electrolytic solution inlet), the first surface of the lid (6) and the second surface of the lid (6) opposite to and being space apart from the electrode body (2) (drawing 2; paragraph 15).

Osamu et al. is silent as to the injection hole (14) for electrolysis solutions (Applicant's electrolytic solution inlet) having an area on one surface of the cap plate different from that on another surface of the cap plate or the injection hole having a sloping cross section.

Yoshimura et al. teaches an electrolyte injection hole (6) in a lid (5) of a battery with first area of a first opening on a first surface facing to an exterior of the battery and a second area of a second opening on a second surface facing the electrode unit (2, 3, 4), with the first area being smaller than the second area, and that this electrolyte injection hole (6) is the pouring-in mouth used for pouring the electrolyte into a battery case in order to promptly distribute the electrolyte between the electrodes and battery case (drawing 1; abstract; paragraphs 11-13 and 17-18), please see Examiner's annotated drawing 1 below.

Annotated Drawing 1



It would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize Yoshimura et al.'s electrolyte injection hole (6), because Yoshimura et al. teaches that this electrolyte injection hole (6) is the pouring-in mouth used for pouring the electrolyte into a battery case in order to promptly distribute the

electrolyte between the electrodes and battery case (drawing 1; abstract; paragraphs 11-13 and 17-18).

Regarding claim 8, Osamu et al. modified by Yoshimura et al. teaches Yoshimura et al.'s electrolyte injection hole (6) which has a sloping cross-section (Yoshimura et al. drawing 1).

Regarding claim 9, Osamu et al. discloses a plug (16) which stopped up injection hole (14), in drawing 2 it is seen that the plug (16) is in placed in a stepped portion of injection hole (14), and that this stepped portion is recessed to the depth of the thickness of the plug (16) (Applicant's predetermined depth) (drawing 2; paragraph 15).

Regarding claim 11, Osamu et al. discloses the electric conduction tab (5) (Applicant's first electrode tab) being electrically connected to the negative pole output terminal (9) (Applicant's terminal pin). The electrical connection is the electric conduction tab (5) (Applicant's first electrode tab) being welded to the pressure plate (10), which is attached to the negative pole output terminal (9) (Applicant's terminal pin) (drawings 1-2; paragraphs 18-19). The negative pole output terminal (9) (Applicant's terminal pin) is physically connected to the lid (6) (Applicant's cap plate) and electrically insulated from the lid (6) with electric insulating plate (11) and gasket (8) (drawing 1; paragraph 18). The electric conduction tab (4) (Applicant's second electrode tab) is welded to the inner surface of the lid (6) (Applicant's cap plate) (drawing 2; paragraph 19) at a position in between the negative pole output terminal (9) (Applicant's terminal pin) and the injection hole (14) for electrolysis solutions (Applicant's electrolytic solution inlet) (drawing 2).

13. Claims 4-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Osamu et al. (JP 2000-208130) in view of Yoshimura et al. (JP 06-096793) as applied to claims 1, 8-9 and 11 above, and further in view of Uba (US 4,421,832).

Regarding claims 4-6, Osamu et al. is silent as to further comprising a channel.

Uba teaches channels (36'), which are similar channels to the channels (36) on the bottom of the jar, adapted to facilitate injection of an electrolyte (Applicant's electrolytic solution) in the neighborhood of the central vent opening (42) whereby electrolyte is delivered (Applicant's electrolytic solution inlet). One end of the channels (36') extends from (Applicant's is integrated with and connected to) the central vent opening (42) whereby electrolyte is delivered (Applicant's electrolytic solution inlet). The channels (36') are linearly shaped and arranged radially in the neighborhood of the central vent opening (42') whereby electrolyte is delivered (Applicant's electrolytic solution inlet) (figures 4 and 6; column 3, lines 51-60). Uba teaches that because of these channels the electrolyte is distributed uniformly to the cell (column 3, lines 35-39 and lines 56-60). It would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize Uba's channels with the injection hole (14) of Osamu modified by Kono et al. for electrolysis solutions (Applicant's electrolytic solution inlet), because Uba teaches that these channels cause the electrolyte to be distributed uniformly to the cell (column 3, lines 56-60).

14. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Osamu et al. (JP 2000-208130) in view of Yoshimura et al. (JP 06-096793) and Uba (US 4,421,832) as applied to claims 1, 4-6, 8-9 and 11 above, and further in view of Planchat (US 4,735,630).

Osamu et al. in view of Uba teaches an injection hole (14) for electrolysis solutions (Applicant's electrolytic solution inlet) with Uba's channels (36'). Uba teaches that these channels are 1/8 inch, which is 3 mm (column 5, lines 28-30).

Planchat teaches channels (31 and 34) used to disperse electrolyte from an electrolyte inlet orifice (30) (Applicant's electrolytic solution inlet) are 0.2 to 0.3 mm in depth, which falls within Applicant's range of 0.1 to 0.5 mm (figure 3; column 3, lines 28-39). Planchat teaches that the shapes and depths of the channels are chosen in order to obtain a uniform flowrate, and that the configuration having channels at this depth ensures that electrolyte is uniformly distributed (column 3, lines 14-45). It would have been obvious to one of ordinary skill in the art at the time the invention was made for to have the depth of channels of Osamu et al. as modified by Uba to be 0.2 to 0.3 mm, because Planchat teaches that the depths of the channels are chosen in order to obtain a uniform flowrate, and that the configuration having channels at this depth ensures that electrolyte is uniformly distributed (column 3, lines 14-45).

15. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Osamu et al. (JP 2000-208130) in view of Yoshimura et al. (JP 06-096793), Uba (US 4,421,832), and Planchat (US 4,735,630) as applied to claims 1, 4-9 and 11 above, and

further in view of Watari (JP 2001-313022, refer to IPDL JPO machine translation for citation).

Osamu et al. discloses a plug (16) which stopped up injection hole (14), in drawing 2 it is seen that the plug (16) is in placed in a stepped portion of injection hole (14), and that this stepped portion is recessed to the depth of the thickness of the plug (16), and that this plug (16) is welded to the lid (6) in order to seal the battery (Applicant's predetermined depth) (drawing 2; paragraph 15), but is silent as to the measurement of the depth of the stepped portion.

Watari teaches the use of a metal sealing part (41) that fits into a crevice (11) in the electrolysis solution inlet (1) and that the crevice (11) and that the metal sealing part (41) is 0.2 mm in thickness, and that this metal sealing part (41) is welded onto the battery container (2) (drawing 3; paragraphs 22, 25).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to make the depth of the stepped portion be 0.2 mm, because Osamu et al. discloses a plug (16) with a thickness that is equivalent to the depth of the stepped portion (drawing 2; paragraph 15), and Watari teaches that a metal sealing part (41) in a crevice around an electrolysis solution inlet has a thickness of 0.2 mm and that this thickness is used in welding (drawing 3; paragraphs 22, 25), thus a thickness of 0.2 mm is appropriate for the plug in order to be welded to the lid.

16. Claims 12-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Osamu et al. (JP 2000-208130) in view of Yoshimura et al. (JP 06-096793), Uba (US

4,421,832), Planchat (US 4,735,630) and Watari (JP 2001-313022) as applied to claims 1 and 4-11 above, and further in view of Masumoto et al. (WO/2003/003485, refer to English equivalent US 2003/0180582 for cited information).

Regarding claim 12, Osamu et al. discloses the electric conduction tab (5) (Applicant's first electrode tab) being electrically connected to the negative pole output terminal (9) (Applicant's terminal pin). The electrical connection is the electric conduction tab (5) (Applicant's first electrode tab) being welded to the pressure plate (10), which is attached to the negative pole output terminal (9) (Applicant's terminal pin) (drawings 1-2; paragraphs 18-19). The negative pole output terminal (9) (Applicant's terminal pin) is physically connected to the lid (6) (Applicant's cap plate) and electrically insulated from the lid (6) with electric insulating plate (11) and gasket (8) (drawing 1; paragraph 18). The electric conduction tab (4) (Applicant's second electrode tab) is welded to the inner surface of the lid (6) (Applicant's cap plate) (drawing 2; paragraph 19) at a position in between the injection hole (14) for electrolysis solutions (Applicant's electrolytic solution inlet) and the negative pole output terminal (9) (Applicant's terminal pin) (drawing 2).

Osamu et al. is silent as to the electric conduction tab (4) (Applicant's second electrode tab) being welded to the lid (6) (Applicant's cap plate) at a first position and the negative pole output terminal (9) (Applicant's terminal pin) being disposed between an electrolytic solution inlet and the electric conduction tab (4) (Applicant's second electrode tab and first position).

Masumoto et al. teaches a positive lead plate (4) (Applicant's second electrode tab) being soldered (Applicant's welded) to the sealing plate (23) (Applicant's cap plate) at a first position and the negative electrode rivet (25) (Applicant's terminal pin) being disposed between the electrolyte injection hole (filled with plug 27) (Applicant's electrolytic solution inlet) and the positive lead plate (4) (Applicant's second electrode tab and first position) (figures 2B and 11A; paragraphs 64 and 77). It would have been obvious to one of ordinary skill in the art at the time the invention was made to rearrange Osamu et al.'s electric conduction tab (4) (Applicant's second electrode tab) to the arrangement of Masumoto et al.'s positive lead plate (4) (Applicant's second electrode tab), with Osamu et al.'s electric conduction tab (4) (Applicant's second electrode tab) being welded to the lid (6) (Applicant's cap plate) at a first position and the negative pole output terminal (9) (Applicant's terminal pin) being disposed between the electrolytic solution inlet (Applicant's electrolytic solution inlet) and the first position, because Masumoto et al. teaches that it is a known arrangement in the art, and since it has been held that rearranging parts of an invention involves only routine skill in the art. *In re Japikse*, 86 USPQ 70. See MPEP 2144.

Regarding claim 13, Osamu et al. discloses a cleavage vent (13) (Applicant safety vent) arranged at a position opposite to the negative pole output terminal (9) (Applicant's terminal pin), and the cleavage vent (13) (Applicant safety vent) being adapted to rupture when the internal pressure of the sealed case (Applicant's can) exceeds constant value (Applicant's increases to a level greater than a predetermined allowed level) (drawing 2; paragraph 15). Osamu et al. is silent as to the cleavage vent

(13) (Applicant safety vent) being arranged at a position opposite to the negative pole output terminal (9) (Applicant's terminal pin) with respect to the electric conduction tab (4) (Applicant's second electrode tab) of the lid (6) (Applicant's cap plate).

Masumoto et al. teaches a vent hole (20a) (Applicant's safety vent) being arranged at a second position, the positive lead plate (4) (Applicant's second electrode tab) being disposed between the negative electrode rivet (25) (Applicant's terminal pin) and the second position (figures 2B and 11A; paragraphs 64, 72, and 77). It would have been obvious to one of ordinary skill in the art at the time the invention was made to rearrange Osamu et al.'s electric conduction tab (4) (Applicant's second electrode tab) to the arrangement of Masumoto et al.'s positive lead plate (4) (Applicant's second electrode tab), with Osamu et al.'s cleavage vent (13) (Applicant safety vent) being arranged at a second, the position opposite to the electric conduction tab (4) (Applicant's second electrode tab) being disposed between the negative pole output terminal (9) (Applicant's terminal pin) and the second position, because Masumoto et al. teaches that it is a known arrangement in the art, and since it has been held that rearranging parts of an invention involves only routine skill in the art. *In re Japikse*, 86 USPQ 70. See MPEP 2144.

17. Claims 14, 23-24 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Osamu et al. (JP 2000-208130) in view of Yoshimura et al. (JP 06-096793) and Masumoto et al. (WO/2003/003485), as applied to 1 and 4-13 above.

Regarding claim 14, Osamu et al. discloses a secondary battery (paragraph 13) comprising:

- an electrode body (2) (Applicant's unit) having a positive electrode sheet and a negative electrode sheet (Applicant's first and second electrode plates), a separator interposed therebetween, and two electric conduction tabs (4 and 5) (Applicant's first and second electrode tabs) respectively drawn upward (Applicant's extending from) the positive electrode sheet and the negative electrode sheet (Applicant's first and second electrode plates) (drawing 2; paragraph 13);
- a cell case (1) (Applicant's can) adapted to encase the electrode body (2) and electrolysis solution (Applicant's electrolytic solution);
- a lid (6) (Applicant's cap plate) adapted to seal the can (paragraph 2, lines 1-2);
- a negative pole output terminal (9) (Applicant's terminal pin) being electrically connected to the an electric conduction tab (5) (Applicant's first electrode tab) and physically connected to the lid (6) (Applicant's cap plate) and electrically insulated from the lid (6) with electric insulating plate (11) and gasket (8) (drawings 1-2; paragraphs 18-19);
- an electric insulating plate (11) is provided on a second surface of the lid (6) (Applicant's cap plate) and extending in a direction along which the lid (6) (Applicant's cap plate) and arranged to insulate the negative pole output terminal (9) (Applicant's terminal pin) from the lid (6) (Applicant's cap plate) (drawings 1-2; paragraph 18);

- the electric conduction tab (4) (Applicant's second electrode tab) is welded to the inner surface of the lid (6) (Applicant's cap plate) (drawing 2; paragraph 19) at a position in between the injection hole (14) for electrolysis solutions (Applicant's electrolytic solution inlet) and the negative pole output terminal (9) (Applicant's terminal pin) (drawing 2),
- and having an injection hole (14) for electrolysis solutions (Applicant's electrolytic solution inlet), the first surface of the lid (6) and the second surface of the lid (6) opposite to and being space apart from the electrode body (2) (drawing 2; paragraph 15).

Osamu et al. is silent as to the injection hole (14) for electrolysis solution (Applicant's electrolytic solution inlet) having an area on the interior surface of the cap plate being bigger than that on exterior surface of the cap plate.

Yoshimura et al. teaches an electrolyte injection hole (6) in a lid (5) of a battery with first area of a first opening on a first surface facing to an exterior of the battery and a second area of a second opening on a second surface facing the electrode unit (2, 3, 4), with the first area being smaller than the second area, and that this electrolyte injection hole (6) is the pouring-in mouth used for pouring the electrolyte into a battery case in order to promptly distribute the electrolyte between the electrodes and battery case (drawing 1; abstract; paragraphs 11-13 and 17-18), please see Examiner's annotated drawing 1 above in paragraph 12. It would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize Yoshimura et al.'s electrolyte injection hole (6), because Yoshimura et al. teaches that this electrolyte

injection hole (6) is the pouring-in mouth used for pouring the electrolyte into a battery case in order to promptly distribute the electrolyte between the electrodes and battery case (drawing 1; abstract; paragraphs 11-13 and 17-18).

Osamu et al. is silent as to the negative pole output terminal (9) (Applicant's terminal pin) being disposed between an electrolytic solution inlet and the electric conduction tab (4) (Applicant's second electrode tab).

Masumoto et al. teaches a positive lead plate (4) (Applicant's second electrode tab) being soldered (Applicant's welded) to the sealing plate (23) (Applicant's cap plate) at a first position and the negative electrode rivet (25) (Applicant's terminal pin) being disposed between the electrolyte injection hole (filled with plug 27) (Applicant's electrolytic solution inlet) and the positive lead plate (4) (Applicant's second electrode tab) (figures 2B and 11A; paragraphs 64 and 77). It would have been obvious to one of ordinary skill in the art at the time the invention was made to rearrange Osamu et al.'s electric conduction tab (4) (Applicant's second electrode tab) to the arrangement of Masumoto et al.'s positive lead plate (4) (Applicant's second electrode tab), with Osamu et al.'s electric conduction tab (4) (Applicant's second electrode tab) being welded to the lid (6) (Applicant's cap plate) at a first position and the negative pole output terminal (9) (Applicant's terminal pin) being disposed between the electrolytic solution inlet (Applicant's electrolytic solution inlet) and the electric conduction tab (4) (Applicant's second electrode tab), because Masumoto et al. teaches that it is a known arrangement in the art, and since it has been held that rearranging parts of an invention involves only routine skill in the art. *In re Japikse*, 86 USPQ 70. See MPEP 2144.

Regarding claim 23, Osamu et al. modified by Yoshimura et al. teaches Yoshimura et al.'s electrolyte injection hole (6) which has a sloping cross-section (Yoshimura et al. drawing 1).

Regarding claim 24, Osamu et al. discloses a plug (16) which stopped up injection hole (14), in drawing 2 it is seen that the plug (16) is in placed in a stepped portion of injection hole (14), and that this stepped portion is recessed to the depth of the thickness of the plug (16) (Applicant's predetermined depth) (drawing 2; paragraph 15).

Regarding claim 26, Osamu et al. discloses a cleavage vent (13) (Applicant safety vent) arranged at a position opposite to the negative pole output terminal (9) (Applicant's terminal pin), and the cleavage vent (13) (Applicant safety vent) being adapted to rupture when the internal pressure of the sealed case (Applicant's can) exceeds constant value (Applicant's increases to a level greater than a predetermined allowed level) (drawing 2; paragraph 15), but is silent as to the cleavage vent (13) (Applicant safety vent) being arranged at a position opposite to the negative pole output terminal (9) (Applicant's terminal pin) with respect to the electric conduction tab (4) (Applicant's second electrode tab) of the lid (6) (Applicant's cap plate).

Masumoto et al. teaches a vent hole (20a) (Applicant's safety vent) being arranged at a second position, the positive lead plate (4) (Applicant's second electrode tab) being disposed between the negative electrode rivet (25) (Applicant's terminal pin) and the second position (figures 2B and 11A; paragraphs 64, 72, and 77). It would have been obvious to one of ordinary skill in the art at the time the invention was made

to rearrange Osamu et al.'s electric conduction tab (4) (Applicant's second electrode tab) to the arrangement of Masumoto et al.'s positive lead plate (4) (Applicant's second electrode tab), with Osamu et al.'s cleavage vent (13) (Applicant safety vent) being arranged at a second, the position opposite to the electric conduction tab (4) (Applicant's second electrode tab) being disposed between the negative pole output terminal (9) (Applicant's terminal pin) and the second position, because Masumoto et al. teaches that it is a known arrangement in the art, and since it has been held that rearranging parts of an invention involves only routine skill in the art. *In re Japikse*, 86 USPQ 70. See MPEP 2144.

18. Claims 15, 27 and 35-36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Osamu et al. (JP 2000-208130) in view of Yoshimura et al. (JP 06-096793) and Masumoto et al. (WO/2003/003485) as applied to claims 1, 4-14, 23-24 and 26 above, and further in view of Yamahira et al. (US 2002/0012829).

Regarding claim 15, Osamu et al. discloses an electric insulating plate (11) is provided on an inner surface of the lid (6) (Applicant's cap plate) and extending in one direction of the lid (6) (Applicant's cap plate) (drawings 1-2; paragraph 18) and that the injection hole (14) for electrolysis solutions (Applicant's electrolytic solution inlet) is welded (paragraph 15), but is silent as to the injection hole (14) for electrolysis solutions (Applicant's electrolytic solution inlet) arranged to overlap the electric insulating plate (11), and an injection hole corresponding to the injection hole (14) for electrolysis

solutions (Applicant's electrolytic solution inlet) arranged in the electric insulating plate (11).

Yamahira et al. teaches a solution injection port (45) (Applicant's electrolytic solution inlet) arranged to overlap the gasket (43) (Applicant's insulating plate), and an injection hole corresponding to the solution injection port (45) (Applicant's electrolytic solution inlet) arranged in the gasket (43) (Applicant's insulating plate) (figure12; paragraphs 57-59). Yamahira et al. teaches that this overlapping is done in order to provide a step aimed at assuring sufficient resistance against the force applied at the time of welding the solution injection port (45) (Applicant's electrolytic solution inlet) (figure12; paragraph 59).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to extend Osamu et al.'s electric insulating plate in the direction of Osamu et al.'s injection hole (14) for electrolysis solutions (Applicant's electrolytic solution inlet) in order to utilize Yamahira et al.'s gasket (43) (Applicant's insulating plate) setup which overlaps the solution injection port (45) (Applicant's electrolytic solution inlet) with a corresponding injection hole at Osamu et al.'s injection hole (14) for electrolysis solutions (Applicant's electrolytic solution inlet), because Yamahira et al. teaches that this overlapping is done in order to provide a step aimed at assuring sufficient resistance against the force applied at the time of welding the solution injection port (45) (Applicant's electrolytic solution inlet) (figure12; paragraph 59).

Regarding claim 27, Osamu et al. discloses a secondary battery (paragraph 13) comprising:

- an electrode body (2) (Applicant's unit) having a positive electrode sheet and a negative electrode sheet (Applicant's first and second electrode plates), a separator interposed therebetween, and two electric conduction tabs (4 and 5) (Applicant's first and second electrode tabs) respectively drawn upward (Applicant's extending from) the positive electrode sheet and the negative electrode sheet (Applicant's first and second electrode plates) (drawing 2; paragraph 13);
- a cell case (1) (Applicant's can) adapted to encase the electrode body (2) and electrolysis solution (Applicant's electrolytic solution);
- a lid (6) (Applicant's cap plate) adapted to seal the can (paragraph 2, lines 1-2);
- a negative pole output terminal (9) (Applicant's terminal pin) being electrically connected to the an electric conduction tab (5) (Applicant's first electrode tab) and physically connected to the lid (6) (Applicant's cap plate) and electrically insulated from the lid (6) with electric insulating plate (11) and gasket (8) (drawings 1-2; paragraphs 18-19);
- an electric insulating plate (11) is provided on a second surface of the lid (6) (Applicant's cap plate) and extending in a direction along which the lid (6) (Applicant's cap plate) and arranged to insulate the negative pole output terminal (9) (Applicant's terminal pin) from the lid (6) (Applicant's cap plate) (drawings 1-2; paragraph 18);
- and having an injection hole (14) for electrolysis solutions (Applicant's electrolytic solution inlet), the first surface of the lid (6) and the second surface of the lid (6)

opposite to and being space apart from the electrode body (2) (drawing 2; paragraph 15).

Osamu et al. also discloses that the injection hole (14) for electrolysis solutions (Applicant's electrolytic solution inlet) is welded (paragraph 15), but is silent as to the injection hole (14) for electrolysis solutions (Applicant's electrolytic solution inlet) arranged to overlap the electric insulating plate (11), and an injection hole corresponding to the injection hole (14) for electrolysis solutions (Applicant's electrolytic solution inlet) arranged in the electric insulating plate (11) or that the area of the opening in the cap plate is smaller than the area of the opening in the insulating plate.

Yamahira et al. teaches a solution injection port (45) (Applicant's electrolytic solution inlet) arranged to overlap the gasket (43) (Applicant's insulating plate), and an injection hole corresponding to the solution injection port (45) (Applicant's electrolytic solution inlet) arranged in the gasket (43) (Applicant's insulating plate) and that the area of the opening of the injection port (45) in the cap plate is smaller than the area of the opening in the gasket (43) (Applicant's insulating plate) (figure12; paragraphs 57-59). Yamahira et al. teaches that this overlapping is done in order to provide a step aimed at assuring sufficient resistance against the force applied at the time of welding the solution injection port (45) (Applicant's electrolytic solution inlet) (figure12; paragraph 59).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to extend Osamu et al.'s electric insulating plate in the direction of Osamu et al.'s injection hole (14) for electrolysis solutions (Applicant's electrolytic

solution inlet) in order to utilize Yamahira et al.'s gasket (43) (Applicant's insulating plate) setup which overlaps the solution injection port (45) (Applicant's electrolytic solution inlet) with a corresponding injection hole at Osamu et al.'s injection hole (14) for electrolysis solutions (Applicant's electrolytic solution inlet), because Yamahira et al. teaches that this overlapping is done in order to provide a step aimed at assuring sufficient resistance against the force applied at the time of welding the solution injection port (45) (Applicant's electrolytic solution inlet) (figure12; paragraph 59).

Osamu et al. is silent as to the injection hole (14) for electrolysis solution (Applicant's electrolytic solution inlet) having the area of the opening in the cap plate is smaller than the area of the opening in the insulating plate

Yoshimura et al. teaches an electrolyte injection hole (6) in a lid (5) of a battery with first area of a first opening on a first surface facing to an exterior of the battery and a second area of a second opening on a second surface facing the electrode unit (2, 3, 4), with the first area being smaller than the second area, and that this electrolyte injection hole (6) is the pouring-in mouth used for pouring the electrolyte into a battery case in order to promptly distribute the electrolyte between the electrodes and battery case (drawing 1; abstract; paragraphs 11-13 and 17-18), please see Examiner's annotated drawing 1 above in paragraph 12.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize Yoshimura et al.'s electrolyte injection hole (6), because Yoshimura et al. teaches that this electrolyte injection hole (6) is the pouring-in mouth used for pouring the electrolyte into a battery case in order to promptly distribute the

electrolyte between the electrodes and battery case (drawing 1; abstract; paragraphs 11-13 and 17-18). Thus, the gasket (Applicant's insulating plate), would have a opening area size corresponding to the opening of the cap plate facing the electrode unit, which is larger than the size of the first area of a first opening on a first surface facing to an exterior of the battery.

Regarding claim 35, Osamu et al. modified by Yoshimura et al. teaches Yoshimura et al.'s electrolyte injection hole (6) which has a sloping cross-section (Yoshimura et al. drawing 1).

Regarding claim 36, Osamu et al. discloses a plug (16) which stopped up injection hole (14), in drawing 2 it is seen that the plug (16) is in placed in a stepped portion of injection hole (14), and that this stepped portion is recessed to the depth of the thickness of the plug (16) (Applicant's predetermined depth) (drawing 2; paragraph 15).

19. Claims 19-21 and 31-33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Osamu et al. (JP 2000-208130) in view of Yoshimura et al. (JP 06-096793), Masumoto et al. (WO/2003/003485) and Yamahira et al. (US 2002/0012829) as applied to claims 1, 4-15, 23-24, 26-27 and 35-36 above, and further in view of Uba (US 4,421,832).

Osamu et al. is silent as to further comprising a channel.

Uba teaches channels (36'), which are similar channels to the channels (36) on the bottom of the jar, adapted to facilitate injection of an electrolyte (Applicant's

electrolytic solution) in the neighborhood of the central vent opening (42) whereby electrolyte is delivered (Applicant's electrolytic solution inlet). One end of the channels (36') extends from (Applicant's is integrated with and connected to) the central vent opening (42) whereby electrolyte is delivered (Applicant's electrolytic solution inlet). The channels (36') are linearly shaped and arranged radially in the neighborhood of the central vent opening (42') whereby electrolyte is delivered (Applicant's electrolytic solution inlet) (figures 4 and 6; column 3, lines 51-60). Uba teaches that because of these channels the electrolyte is distributed uniformly to the cell (column 3, lines 35-39 and lines 56-60). It would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize Uba's channels with the injection hole (14) of Osamu modified by Kono et al. for electrolysis solutions (Applicant's electrolytic solution inlet), because Uba teaches that these channels cause the electrolyte to be distributed uniformly to the cell (column 3, lines 56-60).

20. Claims 22 and 34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Osamu et al. (JP 2000-208130) in view of Yoshimura et al. (JP 06-096793), Masumoto et al. (WO/2003/003485), Yamahira et al. (US 2002/0012829) and Uba (US 4,421,832) as applied to claims 1, 4-15, 19-21, 23-24, 26-27, 31-33 and 35-36 above, and further in view of Planchat (US 4,735,630).

Osamu et al. in view of Uba teaches an injection hole (14) for electrolysis solutions (Applicant's electrolytic solution inlet) with Uba's channels (36'). Uba teaches that these channels are 1/8 inch, which is 3 mm (column 5, lines 28-30).

Planchat teaches channels (31 and 34) used to disperse electrolyte from an electrolyte inlet orifice (30) (Applicant's electrolytic solution inlet) are 0.2 to 0.3 mm in depth, which falls within Applicant's range of 0.1 to 0.5 mm (figure 3; column 3, lines 28-39). Planchat teaches that the shapes and depths of the channels are chosen in order to obtain a uniform flowrate, and that the configuration having channels at this depth ensures that electrolyte is uniformly distributed (column 3, lines 14-45). It would have been obvious to one of ordinary skill in the art at the time the invention was made for to have the depth of channels of Osamu et al. as modified by Uba to be 0.2 to 0.3 mm, because Planchat teaches that the depths of the channels are chosen in order to obtain a uniform flowrate, and that the configuration having channels at this depth ensures that electrolyte is uniformly distributed (column 3, lines 14-45).

21. Claims 25 and 37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Osamu et al. (JP 2000-208130) in view of Yoshimura et al. (JP 06-096793), Masumoto et al. (WO/2003/003485), Yamahira et al. (US 2002/0012829), Uba (US 4,421,832) and Planchat (US 4,735,630) as applied to claims 1, 4-15, 19-24, 26-27 and 31-36 above, and further in view of Watari (JP 2001-313022).

Osamu et al. discloses a plug (16) which stopped up injection hole (14), in drawing 2 it is seen that the plug (16) is in placed in a stepped portion of injection hole (14), and that this stepped portion is recessed to the depth of the thickness of the plug (16), and that this plug (16) is welded to the lid (6) in order to seal the battery

(Applicant's predetermined depth) (drawing 2; paragraph 15), but is silent as to the measurement of the depth of the stepped portion.

Watari teaches the use of a metal sealing part (41) that fits into a crevice (11) in the electrolysis solution inlet (1) and that the crevice (11) and that the metal sealing part (41) is 0.2 mm in thickness, and that this metal sealing part (41) is welded onto the battery container (2) (drawing 3; paragraphs 22, 25).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to make the depth of the stepped portion be 0.2 mm, because Osamu et al. discloses a plug (16) with a thickness that is equivalent to the depth of the stepped portion (drawing 2; paragraph 15), and Watari teaches that a metal sealing part (41) in a crevice around an electrolysis solution inlet has a thickness of 0.2 mm and that this thickness is used in welding (drawing 3; paragraphs 22, 25), thus a thickness of 0.2 mm is appropriate for the plug in order to be welded to the lid.

22. Claims 1, 8-9 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Osamu et al. (JP 2000-208130, refer to IPDL JPO machine translation for citation) in view of Zupancic (US 4,592,970).

As to claims 1 and 8, Osamu et al. discloses a secondary battery (paragraph 13) comprising:

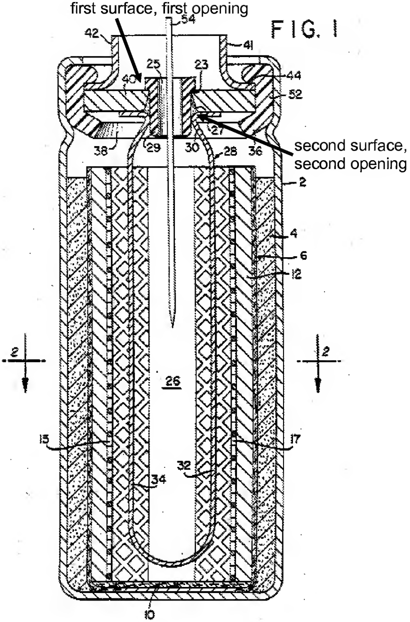
- an electrode body (2) (Applicant's unit) having a positive electrode sheet and a negative electrode sheet (Applicant's first and second electrode plates), a separator interposed therebetween, and two electric conduction tabs (4 and 5)

(Applicant's first and second electrode tabs) respectively drawn upward (Applicant's extending from) the positive electrode sheet and the negative electrode sheet (Applicant's first and second electrode plates) (drawing 2; paragraph 13);

- a cell case (1) (Applicant's can) adapted to accommodate the electrode unit and electrolysis solution (Applicant's electrolytic solution); and
- a lid (6) (Applicant's cap plate) adapted to seal the can (paragraph 2, lines 1-2) and having an injection hole (14) for electrolysis solutions (Applicant's electrolytic solution inlet), the first surface of the lid (6) and the second surface of the lid (6) opposite to and being space apart from the electrode body (2) (drawing 2; paragraph 15).

Osamu et al. is silent as to the injection hole (14) for electrolysis solutions (Applicant's electrolytic solution inlet) having an area on one surface of the cap plate different from that on another surface of the cap plate or the injection hole having a sloping cross section.

Zupancic teaches injecting electrolyte into an orifice (23) in a cover (40) with a sealant layer (27) disposed between the walls of the orifice (23) and the liner (29) inserted into the orifice (23), and that the sealant layer (27) is critically important to retard creepage of electrolyte, as seen in figure 1 the orifice (23) has sloped side with the first opening having a smaller area than the second opening (figure 1; column 9, lines 23-67), please see Examiner's annotated figure 1 below.



It would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize Zupancic's orifice (23) with the sloping sides with sealant disposed between the injection hole (14) and the plug (16) inserted in the injection hole (14), because Zupancic teaches that this orifice (23) with the sealant (27) disposed

between the orifice (23) walls and the liner (29) inserted in the orifice (23) is critically important to retard creepage of electrolyte (figure 1; column 9, lines 23-67).

Regarding claim 8, Osamu et al. modified by Zupancic teaches Zupancic orifice (23) which has a sloping cross-section (Zupancic figure 1).

Regarding claim 9, Osamu et al. discloses a plug (16) which stopped up injection hole (14), in drawing 2 it is seen that the plug (16) is in placed in a stepped portion of injection hole (14), and that this stepped portion is recessed to the depth of the thickness of the plug (16) (Applicant's predetermined depth) (drawing 2; paragraph 15).

Regarding claim 11, Osamu et al. discloses the electric conduction tab (5) (Applicant's first electrode tab) being electrically connected to the negative pole output terminal (9) (Applicant's terminal pin). The electrical connection is the electric conduction tab (5) (Applicant's first electrode tab) being welded to the pressure plate (10), which is attached to the negative pole output terminal (9) (Applicant's terminal pin) (drawings 1-2; paragraphs 18-19). The negative pole output terminal (9) (Applicant's terminal pin) is physically connected to the lid (6) (Applicant's cap plate) and electrically insulated from the lid (6) with electric insulating plate (11) and gasket (8) (drawing 1; paragraph 18). The electric conduction tab (4) (Applicant's second electrode tab) is welded to the inner surface of the lid (6) (Applicant's cap plate) (drawing 2; paragraph 19) at a position in between the negative pole output terminal (9) (Applicant's terminal pin) and the injection hole (14) for electrolysis solutions (Applicant's electrolytic solution inlet) (drawing 2).

23. Claims 4-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Osamu et al. (JP 2000-208130) in view of Zupancic (US 4,592,970) as applied to claims 1, 8-9 and 11 above, and further in view of Uba (US 4,421,832).

Regarding claims 4-6, Osamu et al. is silent as to further comprising a channel.

Uba teaches channels (36'), which are similar channels to the channels (36) on the bottom of the jar, adapted to facilitate injection of an electrolyte (Applicant's electrolytic solution) in the neighborhood of the central vent opening (42) whereby electrolyte is delivered (Applicant's electrolytic solution inlet). One end of the channels (36') extends from (Applicant's is integrated with and connected to) the central vent opening (42) whereby electrolyte is delivered (Applicant's electrolytic solution inlet). The channels (36') are linearly shaped and arranged radially in the neighborhood of the central vent opening (42') whereby electrolyte is delivered (Applicant's electrolytic solution inlet) (figures 4 and 6; column 3, lines 51-60). Uba teaches that because of these channels the electrolyte is distributed uniformly to the cell (column 3, lines 35-39 and lines 56-60). It would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize Uba's channels with the injection hole (14) of Osamu modified by Kono et al. for electrolysis solutions (Applicant's electrolytic solution inlet), because Uba teaches that these channels cause the electrolyte to be distributed uniformly to the cell (column 3, lines 56-60).

24. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Osamu et al. (JP 2000-208130) in view of Zupancic (US 4,592,970) and Uba (US 4,421,832) as

applied to claims 1, 4-6, 8-9 and 11 above, and further in view of Planchat (US 4,735,630).

Osamu et al. in view of Uba teaches an injection hole (14) for electrolysis solutions (Applicant's electrolytic solution inlet) with Uba's channels (36'). Uba teaches that these channels are 1/8 inch, which is 3 mm (column 5, lines 28-30).

Planchat teaches channels (31 and 34) used to disperse electrolyte from an electrolyte inlet orifice (30) (Applicant's electrolytic solution inlet) are 0.2 to 0.3 mm in depth, which falls within Applicant's range of 0.1 to 0.5 mm (figure 3; column 3, lines 28-39). Planchat teaches that the shapes and depths of the channels are chosen in order to obtain a uniform flowrate, and that the configuration having channels at this depth ensures that electrolyte is uniformly distributed (column 3, lines 14-45). It would have been obvious to one of ordinary skill in the art at the time the invention was made for to have the depth of channels of Osamu et al. as modified by Uba to be 0.2 to 0.3 mm, because Planchat teaches that the depths of the channels are chosen in order to obtain a uniform flowrate, and that the configuration having channels at this depth ensures that electrolyte is uniformly distributed (column 3, lines 14-45).

25. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Osamu et al. (JP 2000-208130) in view of Zupancic (US 4,592,970), Uba (US 4,421,832), and Planchat (US 4,735,630) as applied to claims 1, 4-9 and 11 above, and further in view of Watari (JP 2001-313022, refer to IPDL JPO machine translation for citation).

Osamu et al. discloses a plug (16) which stopped up injection hole (14), in drawing 2 it is seen that the plug (16) is in placed in a stepped portion of injection hole (14), and that this stepped portion is recessed to the depth of the thickness of the plug (16), and that this plug (16) is welded to the lid (6) in order to seal the battery (Applicant's predetermined depth) (drawing 2; paragraph 15), but is silent as to the measurement of the depth of the stepped portion.

Watari teaches the use of a metal sealing part (41) that fits into a crevice (11) in the electrolysis solution inlet (1) and that the crevice (11) and that the metal sealing part (41) is 0.2 mm in thickness, and that this metal sealing part (41) is welded onto the battery container (2) (drawing 3; paragraphs 22, 25).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to make the depth of the stepped portion be 0.2 mm, because Osamu et al. discloses a plug (16) with a thickness that is equivalent to the depth of the stepped portion (drawing 2; paragraph 15), and Watari teaches that a metal sealing part (41) in a crevice around an electrolysis solution inlet has a thickness of 0.2 mm and that this thickness is used in welding (drawing 3; paragraphs 22, 25), thus a thickness of 0.2 mm is appropriate for the plug in order to be welded to the lid.

26. Claims 12-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Osamu et al. (JP 2000-208130) in view of Zupancic (US 4,592,970), Uba (US 4,421,832), Planchat (US 4,735,630) and Watari (JP 2001-313022) as applied to claims

1 and 4-11 above, and further in view of Masumoto et al. (WO/2003/003485, refer to English equivalent US 2003/0180582 for cited information).

Regarding claim 12, Osamu et al. discloses the electric conduction tab (5) (Applicant's first electrode tab) being electrically connected to the negative pole output terminal (9) (Applicant's terminal pin). The electrical connection is the electric conduction tab (5) (Applicant's first electrode tab) being welded to the pressure plate (10), which is attached to the negative pole output terminal (9) (Applicant's terminal pin) (drawings 1-2; paragraphs 18-19). The negative pole output terminal (9) (Applicant's terminal pin) is physically connected to the lid (6) (Applicant's cap plate) and electrically insulated from the lid (6) with electric insulating plate (11) and gasket (8) (drawing 1; paragraph 18). The electric conduction tab (4) (Applicant's second electrode tab) is welded to the inner surface of the lid (6) (Applicant's cap plate) (drawing 2; paragraph 19) at a position in between the injection hole (14) for electrolysis solutions (Applicant's electrolytic solution inlet) and the negative pole output terminal (9) (Applicant's terminal pin) (drawing 2).

Osamu et al. is silent as to the electric conduction tab (4) (Applicant's second electrode tab) being welded to the lid (6) (Applicant's cap plate) at a first position and the negative pole output terminal (9) (Applicant's terminal pin) being disposed between an electrolytic solution inlet and the electric conduction tab (4) (Applicant's second electrode tab and first position).

Masumoto et al. teaches a positive lead plate (4) (Applicant's second electrode tab) being soldered (Applicant's welded) to the sealing plate (23) (Applicant's cap plate)

at a first position and the negative electrode rivet (25) (Applicant's terminal pin) being disposed between the electrolyte injection hole (filled with plug 27) (Applicant's electrolytic solution inlet) and the positive lead plate (4) (Applicant's second electrode tab and first position) (figures 2B and 11A; paragraphs 64 and 77). It would have been obvious to one of ordinary skill in the art at the time the invention was made to rearrange Osamu et al.'s electric conduction tab (4) (Applicant's second electrode tab) to the arrangement of Masumoto et al.'s positive lead plate (4) (Applicant's second electrode tab), with Osamu et al.'s electric conduction tab (4) (Applicant's second electrode tab) being welded to the lid (6) (Applicant's cap plate) at a first position and the negative pole output terminal (9) (Applicant's terminal pin) being disposed between the electrolytic solution inlet (Applicant's electrolytic solution inlet) and the first position, because Masumoto et al. teaches that it is a known arrangement in the art, and since it has been held that rearranging parts of an invention involves only routine skill in the art. *In re Japikse*, 86 USPQ 70. See MPEP 2144.

Regarding claim 13, Osamu et al. discloses a cleavage vent (13) (Applicant safety vent) arranged at a position opposite to the negative pole output terminal (9) (Applicant's terminal pin), and the cleavage vent (13) (Applicant safety vent) being adapted to rupture when the internal pressure of the sealed case (Applicant's can) exceeds constant value (Applicant's increases to a level greater than a predetermined allowed level) (drawing 2; paragraph 15). Osamu et al. is silent as to the cleavage vent (13) (Applicant safety vent) being arranged at a position opposite to the negative pole

output terminal (9) (Applicant's terminal pin) with respect to the electric conduction tab (4) (Applicant's second electrode tab) of the lid (6) (Applicant's cap plate).

Masumoto et al. teaches a vent hole (20a) (Applicant's safety vent) being arranged at a second position, the positive lead plate (4) (Applicant's second electrode tab) being disposed between the negative electrode rivet (25) (Applicant's terminal pin) and the second position (figures 2B and 11A; paragraphs 64, 72, and 77). It would have been obvious to one of ordinary skill in the art at the time the invention was made to rearrange Osamu et al.'s electric conduction tab (4) (Applicant's second electrode tab) to the arrangement of Masumoto et al.'s positive lead plate (4) (Applicant's second electrode tab), with Osamu et al.'s cleavage vent (13) (Applicant safety vent) being arranged at a second, the position opposite to the electric conduction tab (4) (Applicant's second electrode tab) being disposed between the negative pole output terminal (9) (Applicant's terminal pin) and the second position, because Masumoto et al. teaches that it is a known arrangement in the art, and since it has been held that rearranging parts of an invention involves only routine skill in the art. *In re Japikse*, 86 USPQ 70. See MPEP 2144.

27. Claims 14, 23-24 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Osamu et al. (JP 2000-208130) in view of Zupancic (US 4,592,970) and Masumoto et al. (WO/2003/003485), as applied to 1 and 4-13 above.

Regarding claim 14, Osamu et al. discloses a secondary battery (paragraph 13) comprising:

- an electrode body (2) (Applicant's unit) having a positive electrode sheet and a negative electrode sheet (Applicant's first and second electrode plates), a separator interposed therebetween, and two electric conduction tabs (4 and 5) (Applicant's first and second electrode tabs) respectively drawn upward (Applicant's extending from) the positive electrode sheet and the negative electrode sheet (Applicant's first and second electrode plates) (drawing 2; paragraph 13);
- a cell case (1) (Applicant's can) adapted to encase the electrode body (2) and electrolysis solution (Applicant's electrolytic solution);
- a lid (6) (Applicant's cap plate) adapted to seal the can (paragraph 2, lines 1-2);
- a negative pole output terminal (9) (Applicant's terminal pin) being electrically connected to the an electric conduction tab (5) (Applicant's first electrode tab) and physically connected to the lid (6) (Applicant's cap plate) and electrically insulated from the lid (6) with electric insulating plate (11) and gasket (8) (drawings 1-2; paragraphs 18-19);
- an electric insulating plate (11) is provided on a second surface of the lid (6) (Applicant's cap plate) and extending in a direction along which the lid (6) (Applicant's cap plate) and arranged to insulate the negative pole output terminal (9) (Applicant's terminal pin) from the lid (6) (Applicant's cap plate) (drawings 1-2; paragraph 18);
- the electric conduction tab (4) (Applicant's second electrode tab) is welded to the inner surface of the lid (6) (Applicant's cap plate) (drawing 2; paragraph 19) at a

position in between the injection hole (14) for electrolysis solutions (Applicant's electrolytic solution inlet) and the negative pole output terminal (9) (Applicant's terminal pin) (drawing 2),

- and having an injection hole (14) for electrolysis solutions (Applicant's electrolytic solution inlet), the first surface of the lid (6) and the second surface of the lid (6) opposite to and being space apart from the electrode body (2) (drawing 2; paragraph 15).

Osamu et al. is silent as to the injection hole (14) for electrolysis solution (Applicant's electrolytic solution inlet) having an area on the interior surface of the cap plate being bigger than that on exterior surface of the cap plate.

Zupancic teaches injecting electrolyte into an orifice (23) in a cover (40) with a sealant layer (27) disposed between the walls of the orifice (23) and the liner (29) inserted into the orifice (23), and that the sealant layer (27) is critically important to retard creepage of electrolyte, as seen in figure 1 the orifice (23) has sloped side with the first opening having a smaller area than the second opening (figure 1; column 9, lines 23-67), please see Examiner's annotated figure 1 in paragraph 22 above. It would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize Zupancic's orifice (23) with the sloping sides with sealant disposed between the injection hole (14) and the plug (16) inserted in the injection hole (14), because Zupancic teaches that this orifice (23) with the sealant (27) disposed between the orifice (23) walls and the liner (29) inserted in the orifice (23) is critically important to retard creepage of electrolyte (figure 1; column 9, lines 23-67).

Osamu et al. is silent as to the negative pole output terminal (9) (Applicant's terminal pin) being disposed between an electrolytic solution inlet and the electric conduction tab (4) (Applicant's second electrode tab).

Masumoto et al. teaches a positive lead plate (4) (Applicant's second electrode tab) being soldered (Applicant's welded) to the sealing plate (23) (Applicant's cap plate) at a first position and the negative electrode rivet (25) (Applicant's terminal pin) being disposed between the electrolyte injection hole (filled with plug 27) (Applicant's electrolytic solution inlet) and the positive lead plate (4) (Applicant's second electrode tab) (figures 2B and 11A; paragraphs 64 and 77). It would have been obvious to one of ordinary skill in the art at the time the invention was made to rearrange Osamu et al.'s electric conduction tab (4) (Applicant's second electrode tab) to the arrangement of Masumoto et al.'s positive lead plate (4) (Applicant's second electrode tab), with Osamu et al.'s electric conduction tab (4) (Applicant's second electrode tab) being welded to the lid (6) (Applicant's cap plate) at a first position and the negative pole output terminal (9) (Applicant's terminal pin) being disposed between the electrolytic solution inlet (Applicant's electrolytic solution inlet) and the electric conduction tab (4) (Applicant's second electrode tab), because Masumoto et al. teaches that it is a known arrangement in the art, and since it has been held that rearranging parts of an invention involves only routine skill in the art. *In re Japikse*, 86 USPQ 70. See MPEP 2144.

Regarding claim 23, Osamu et al. modified by Zupancic teaches Zupancic orifice (23) which has a sloping cross-section (Zupancic figure 1).

Regarding claim 24, Osamu et al. discloses a plug (16) which stopped up injection hole (14), in drawing 2 it is seen that the plug (16) is in placed in a stepped portion of injection hole (14), and that this stepped portion is recessed to the depth of the thickness of the plug (16) (Applicant's predetermined depth) (drawing 2; paragraph 15).

Regarding claim 26, Osamu et al. discloses a cleavage vent (13) (Applicant safety vent) arranged at a position opposite to the negative pole output terminal (9) (Applicant's terminal pin), and the cleavage vent (13) (Applicant safety vent) being adapted to rupture when the internal pressure of the sealed case (Applicant's can) exceeds constant value (Applicant's increases to a level greater than a predetermined allowed level) (drawing 2; paragraph 15), but is silent as to the cleavage vent (13) (Applicant safety vent) being arranged at a position opposite to the negative pole output terminal (9) (Applicant's terminal pin) with respect to the electric conduction tab (4) (Applicant's second electrode tab) of the lid (6) (Applicant's cap plate).

Masumoto et al. teaches a vent hole (20a) (Applicant's safety vent) being arranged at a second position, the positive lead plate (4) (Applicant's second electrode tab) being disposed between the negative electrode rivet (25) (Applicant's terminal pin) and the second position (figures 2B and 11A; paragraphs 64, 72, and 77). It would have been obvious to one of ordinary skill in the art at the time the invention was made to rearrange Osamu et al.'s electric conduction tab (4) (Applicant's second electrode tab) to the arrangement of Masumoto et al.'s positive lead plate (4) (Applicant's second electrode tab), with Osamu et al.'s cleavage vent (13) (Applicant safety vent) being

arranged at a second, the position opposite to the electric conduction tab (4) (Applicant's second electrode tab) being disposed between the negative pole output terminal (9) (Applicant's terminal pin) and the second position, because Masumoto et al. teaches that it is a known arrangement in the art, and since it has been held that rearranging parts of an invention involves only routine skill in the art. *In re Japikse*, 86 USPQ 70. See MPEP 2144.

28. Claims 15, 27 and 35-36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Osamu et al. (JP 2000-208130) in view of Zupancic (US 4,592,970) and Masumoto et al. (WO/2003/003485) as applied to claims 1, 4-14, 23-24 and 26 above, and further in view of Yamahira et al. (US 2002/0012829).

Regarding claim 15, Osamu et al. discloses an electric insulating plate (11) is provided on an inner surface of the lid (6) (Applicant's cap plate) and extending in one direction of the lid (6) (Applicant's cap plate) (drawings 1-2; paragraph 18) and that the injection hole (14) for electrolysis solutions (Applicant's electrolytic solution inlet) is welded (paragraph 15), but is silent as to the injection hole (14) for electrolysis solutions (Applicant's electrolytic solution inlet) arranged to overlap the electric insulating plate (11), and an injection hole corresponding to the injection hole (14) for electrolysis solutions (Applicant's electrolytic solution inlet) arranged in the electric insulating plate (11).

Yamahira et al. teaches a solution injection port (45) (Applicant's electrolytic solution inlet) arranged to overlap the gasket (43) (Applicant's insulating plate), and an

injection hole corresponding to the solution injection port (45) (Applicant's electrolytic solution inlet) arranged in the gasket (43) (Applicant's insulating plate) (figure12; paragraphs 57-59). Yamahira et al. teaches that this overlapping is done in order to provide a step aimed at assuring sufficient resistance against the force applied at the time of welding the solution injection port (45) (Applicant's electrolytic solution inlet) (figure12; paragraph 59).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to extend Osamu et al.'s electric insulating plate in the direction of Osamu et al.'s injection hole (14) for electrolysis solutions (Applicant's electrolytic solution inlet) in order to utilize Yamahira et al.'s gasket (43) (Applicant's insulating plate) setup which overlaps the solution injection port (45) (Applicant's electrolytic solution inlet) with a corresponding injection hole at Osamu et al.'s injection hole (14) for electrolysis solutions (Applicant's electrolytic solution inlet), because Yamahira et al. teaches that this overlapping is done in order to provide a step aimed at assuring sufficient resistance against the force applied at the time of welding the solution injection port (45) (Applicant's electrolytic solution inlet) (figure12; paragraph 59).

Regarding claim 27, Osamu et al. discloses a secondary battery (paragraph 13) comprising:

- an electrode body (2) (Applicant's unit) having a positive electrode sheet and a negative electrode sheet (Applicant's first and second electrode plates), a separator interposed therebetween, and two electric conduction tabs (4 and 5) (Applicant's first and second electrode tabs) respectively drawn upward

(Applicant's extending from) the positive electrode sheet and the negative electrode sheet (Applicant's first and second electrode plates) (drawing 2; paragraph 13);

- a cell case (1) (Applicant's can) adapted to encase the electrode body (2) and electrolysis solution (Applicant's electrolytic solution);
- a lid (6) (Applicant's cap plate) adapted to seal the can (paragraph 2, lines 1-2);
- a negative pole output terminal (9) (Applicant's terminal pin) being electrically connected to the an electric conduction tab (5) (Applicant's first electrode tab) and physically connected to the lid (6) (Applicant's cap plate) and electrically insulated from the lid (6) with electric insulating plate (11) and gasket (8) (drawings 1-2; paragraphs 18-19);
- an electric insulating plate (11) is provided on a second surface of the lid (6) (Applicant's cap plate) and extending in a direction along which the lid (6) (Applicant's cap plate) and arranged to insulate the negative pole output terminal (9) (Applicant's terminal pin) from the lid (6) (Applicant's cap plate) (drawings 1-2; paragraph 18);
- and having an injection hole (14) for electrolysis solutions (Applicant's electrolytic solution inlet), the first surface of the lid (6) and the second surface of the lid (6) opposite to and being space apart from the electrode body (2) (drawing 2; paragraph 15).

Osamu et al. also discloses that the injection hole (14) for electrolysis solutions (Applicant's electrolytic solution inlet) is welded (paragraph 15), but is silent as to the

injection hole (14) for electrolysis solutions (Applicant's electrolytic solution inlet) arranged to overlap the electric insulating plate (11), and an injection hole corresponding to the injection hole (14) for electrolysis solutions (Applicant's electrolytic solution inlet) arranged in the electric insulating plate (11) or that the area of the opening in the cap plate is smaller than the area of the opening in the insulating plate.

Yamahira et al. teaches a solution injection port (45) (Applicant's electrolytic solution inlet) arranged to overlap the gasket (43) (Applicant's insulating plate), and an injection hole corresponding to the solution injection port (45) (Applicant's electrolytic solution inlet) arranged in the gasket (43) (Applicant's insulating plate) and that the area of the opening of the injection port (45) in the cap plate is smaller than the area of the opening in the gasket (43) (Applicant's insulating plate) (figure12; paragraphs 57-59). Yamahira et al. teaches that this overlapping is done in order to provide a step aimed at assuring sufficient resistance against the force applied at the time of welding the solution injection port (45) (Applicant's electrolytic solution inlet) (figure12; paragraph 59).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to extend Osamu et al.'s electric insulating plate in the direction of Osamu et al.'s injection hole (14) for electrolysis solutions (Applicant's electrolytic solution inlet) in order to utilize Yamahira et al.'s gasket (43) (Applicant's insulating plate) setup which overlaps the solution injection port (45) (Applicant's electrolytic solution inlet) with a corresponding injection hole at Osamu et al.'s injection hole (14) for electrolysis solutions (Applicant's electrolytic solution inlet), because Yamahira et al.

teaches that this overlapping is done in order to provide a step aimed at assuring sufficient resistance against the force applied at the time of welding the solution injection port (45) (Applicant's electrolytic solution inlet) (figure12; paragraph 59).

Osamu et al. is silent as to the injection hole (14) for electrolysis solution (Applicant's electrolytic solution inlet) having the area of the opening in the cap plate is smaller than the area of the opening in the insulating plate

Zupancic teaches injecting electrolyte into an orifice (23) in a cover (40) with a sealant layer (27) disposed between the walls of the orifice (23) and the liner (29) inserted into the orifice (23), and that the sealant layer (27) is critically important to retard creepage of electrolyte, as seen in figure 1 the orifice (23) has sloped side with the first opening having a smaller area than the second opening (figure 1; column 9, lines 23-67), please see Examiner's annotated figure 1 in paragraph 22 above. It would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize Zupancic's orifice (23) with the sloping sides with sealant disposed between the injection hole (14) and the plug (16) inserted in the injection hole (14), because Zupancic teaches that this orifice (23) with the sealant (27) disposed between the orifice (23) walls and the liner (29) inserted in the orifice (23) is critically important to retard creepage of electrolyte (figure 1; column 9, lines 23-67). Thus, the gasket (Applicant's insulating plate), would have a opening area size corresponding to the opening of the cap plate facing the electrode unit, which is larger than the size of the first area of a first opening on a first surface facing to an exterior of the battery.

Regarding claim 35, Osamu et al. modified by Zupancic teaches Zupancic orifice (23) which has a sloping cross-section (Zupancic figure 1).

Regarding claim 36, Osamu et al. discloses a plug (16) which stopped up injection hole (14), in drawing 2 it is seen that the plug (16) is in placed in a stepped portion of injection hole (14), and that this stepped portion is recessed to the depth of the thickness of the plug (16) (Applicant's predetermined depth) (drawing 2; paragraph 15).

29. Claims 19-21 and 31-33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Osamu et al. (JP 2000-208130) in view of Zupancic (US 4,592,970), Masumoto et al. (WO/2003/003485) and Yamahira et al. (US 2002/0012829) as applied to claims 1, 4-15, 23-24, 26-27 and 35-36 above, and further in view of Uba (US 4,421,832).

Osamu et al. is silent as to further comprising a channel.

Uba teaches channels (36'), which are similar channels to the channels (36) on the bottom of the jar, adapted to facilitate injection of an electrolyte (Applicant's electrolytic solution) in the neighborhood of the central vent opening (42) whereby electrolyte is delivered (Applicant's electrolytic solution inlet). One end of the channels (36') extends from (Applicant's is integrated with and connected to) the central vent opening (42) whereby electrolyte is delivered (Applicant's electrolytic solution inlet). The channels (36') are linearly shaped and arranged radially in the neighborhood of the central vent opening (42') whereby electrolyte is delivered (Applicant's electrolytic

solution inlet) (figures 4 and 6; column 3, lines 51-60). Uba teaches that because of these channels the electrolyte is distributed uniformly to the cell (column 3, lines 35-39 and lines 56-60). It would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize Uba's channels with the injection hole (14) of Osamu modified by Kono et al. for electrolysis solutions (Applicant's electrolytic solution inlet), because Uba teaches that these channels cause the electrolyte to be distributed uniformly to the cell (column 3, lines 56-60).

30. Claims 22 and 34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Osamu et al. (JP 2000-208130) in view of Zupancic (US 4,592,970), Masumoto et al. (WO/2003/003485), Yamahira et al. (US 2002/0012829) and Uba (US 4,421,832) as applied to claims 1, 4-15, 19-21, 23-24, 26-27, 31-33 and 35-36 above, and further in view of Planchat (US 4,735,630).

Osamu et al. in view of Uba teaches an injection hole (14) for electrolysis solutions (Applicant's electrolytic solution inlet) with Uba's channels (36'). Uba teaches that these channels are 1/8 inch, which is 3 mm (column 5, lines 28-30).

Planchat teaches channels (31 and 34) used to disperse electrolyte from an electrolyte inlet orifice (30) (Applicant's electrolytic solution inlet) are 0.2 to 0.3 mm in depth, which falls within Applicant's range of 0.1 to 0.5 mm (figure 3; column 3, lines 28-39). Planchat teaches that the shapes and depths of the channels are chosen in order to obtain a uniform flowrate, and that the configuration having channels at this depth ensures that electrolyte is uniformly distributed (column 3, lines 14-45). It would have

been obvious to one of ordinary skill in the art at the time the invention was made for to have the depth of channels of Osamu et al. as modified by Uba to be 0.2 to 0.3 mm, because Planchat teaches that the depths of the channels are chosen in order to obtain a uniform flowrate, and that the configuration having channels at this depth ensures that electrolyte is uniformly distributed (column 3, lines 14-45).

31. Claims 25 and 37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Osamu et al. (JP 2000-208130) in view of Zupancic (US 4,592,970), Masumoto et al. (WO/2003/003485), Yamahira et al. (US 2002/0012829), Uba (US 4,421,832) and Planchat (US 4,735,630) as applied to claims 1, 4-15, 19-24, 26-27 and 31-36 above, and further in view of Watari (JP 2001-313022).

Osamu et al. discloses a plug (16) which stopped up injection hole (14), in drawing 2 it is seen that the plug (16) is in placed in a stepped portion of injection hole (14), and that this stepped portion is recessed to the depth of the thickness of the plug (16), and that this plug (16) is welded to the lid (6) in order to seal the battery (Applicant's predetermined depth) (drawing 2; paragraph 15), but is silent as to the measurement of the depth of the stepped portion.

Watari teaches the use of a metal sealing part (41) that fits into a crevice (11) in the electrolysis solution inlet (1) and that the crevice (11) and that the metal sealing part (41) is 0.2 mm in thickness, and that this metal sealing part (41) is welded onto the battery container (2) (drawing 3; paragraphs 22, 25).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to make the depth of the stepped portion be 0.2 mm, because Osamu et al. discloses a plug (16) with a thickness that is equivalent to the depth of the stepped portion (drawing 2; paragraph 15), and Watari teaches that a metal sealing part (41) in a crevice around an electrolysis solution inlet has a thickness of 0.2 mm and that this thickness is used in welding (drawing 3; paragraphs 22, 25), thus a thickness of 0.2 mm is appropriate for the plug in order to be welded to the lid.

Response to Arguments

32. Applicant's arguments with respect to the rejection(s) of independent claim(s) 1, 14, and 27 under 35 U.S.C. 103(a) have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Yoshimura et al. (JP 06-096793) and another new ground(s) of rejection is made in view of Zupancic (US 4,592,970).

33. Applicant's arguments filed February 12, 2009, regarding claims 4-7, 19-22 and 31-34 have been fully considered but they are not persuasive.

Applicant's principal argument is:

(a) Uba teaches that the channels 36 are located at the bottom of the cell and thus aren't connected to central vent opening (42) (electrolyte inlet) in top of cell, as shown in Figs. 1 and 2.

In response to Applicant's arguments, please consider the following comments.

(a) Uba teaches channels (36'), which are similar channels to the channels (36) on the bottom of the jar, adapted to facilitate injection of an electrolyte (Applicant's electrolytic solution) in the neighborhood of the central vent opening (42) whereby electrolyte is delivered (Applicant's electrolytic solution inlet). Figure 4 shows the top (16) with the channels (36') radially connected with the central vent opening (42), and that these channels (36') are on the interior, facing the electrode unit, of the top (16) (column 3, lines 50-60).

Correspondence/Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Katherine Turner whose telephone number is (571)270-5314. The examiner can normally be reached on Monday through Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dah-Wei Yuan can be reached on (571)272-1295. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/K. T./
Examiner, Art Unit 1795

/Dah-Wei D. Yuan/
Supervisory Patent Examiner, Art Unit 1795